Federation Execution Planning Workbook (FEPW)

AMG 20

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Federation Execution Planning Workbook (FEPW)

FEPW is a set of tables for specifying the configuration and run-time characteristics of a federation execution

- specifies the performance characteristics a user needs from an RTI implementation
- facilitates communication about a federation execution by reducing amiguity in execution details that affect performance

❏ Tables:

- Federation Execution Summary Table
- Host Table
- LAN Table
- RTI Services Table
- Object / Interaction Table

Federation Execution Summary Table

Defines at a high level the composition of a federation execution

❏ Use: describe execution details of federation
  – federation execution name
  – member federate information
    • name
    • API used
    • tick rate
    • time regulating and contraining status
    • host and LAN federate is executing on
  – version of RTI software
  – number and name of concurrent federation executions

Federation Execution Summary Table

Federation Execution Summary Table

Federation Execution Name

Number of Concurrent Federation Executions (total including this Federation

(If more than one, list names of others beyond this fedex)

RTI Software Used (Version)

Federate Summary Information

	Name	API	Tick Rate	Time Management Switches		Host (assign # to each host)	LAN (assign # to each LAN)
		(C++,Ada, IDL, Java)		Regulating (y or n)	Constraining (y or n)	[List data on Host Table]	[List data on LAN Tables]
Fed $_1$							
Fed $_2$							
Fed $_3$							
Fed $_4$							
.							
.							
.							
Fed $_N$							

Host Table

Provides details about hardware that affect performance of federate and RTI

❑ Use: describe for each host the following information
  – hardware
    • architecture
    • number of CPUs
  – operating system
  – free memory available to RTI
  – % of CPU available to RTI and federation
  – % of CPU available to RTI

Host Table

	Hardware	Operating System	Memory available to RTI (MB)	Total CPU Available to Federation and RTI Combined (100%- nominal load)	Total CPU Available to RTI (100%- nominal load - federate load)	Notes (Use to explain how % CPU available to RTI derived)
Host 1						
Host 2						
Host 3						
Host 4						
Host 5						
Host 6						
Host 7						
.						
.						
.						
Host n						

LAN Table

Provides information about bandwidth available and latencies introduced by network infrastructure

❏ Use:

- describe each LAN in the federation execution
  - physical type
  - throughput available to FEDEX
- describe LAN to LAN connectivity
  - type of device used to connect each LAN
  - effective throughput available to fedex for each device
  - latency introduced by device

LAN Table

RTI Services Table

Lists the services a federation execution uses. The services used may affect the performance characteristics of a federation execution

❑ Use: fill out table for each federation execution
  – specify whether each service is used at least once in the federation execution

RTI Services Table

RTI Services Table		
(Check if service to be used at least once during this Federation execution)		
Service	**IF Spec v1.1 Ref**	**Service Used?**
Create Federation Execution	2.1	
Destroy Federation Execution	2.2	
Join Federation Execution	2.3	
Resign Federation Execution	2.4	
Request **Pause**	2.5	
Initiate **Pause**	2.6	
Pause Achieved	2.7	
Request **Resume**	2.8	
Initiate **Resume**	2.9	
Resume Achieved	2.10	
Request **Federation Save**	2.11	
Initiate **Federation Save**	2.12	
Federation Save Begun	2.13	
Federation Save Achieved	2.14	
Request **Restore**	2.15	
Initiate **Restore**	2.16	
Restore Achieved	2.17	
Publish Object Class	3.1	
Subscribe Object Class **Attributes**	3.2	
Publish Interaction	3.3	
Subscribe Interaction	3.4	
Control Updates	3.5	
Control Interactions	3.6	
Request ID	4.1	
Register Object	4.2	
Discover Object	4.3	
Update Attribute Values	4.4	
Reflect Attribute Values	4.5	
Send Interaction	4.6	

Receive Interaction	4.7	
Delete Object	4.8	
Remove Object	4.9	
Change Attribute Transportation Type	4.10	
Change Attribute Order Type	4.11	
Change Interaction Transportation Type	4.12	
Change Interaction Order Type	4.13	
Request Attribute Value Update	4.14	
Provide Attribute Value Update	4.15	
Retract	4.16	
Reflect Retract	4.17	
Request Attribute **Ownership Divestiture**	5.1	
Request Attribute **Ownership Assumption**	5.2	
Attribute Ownership **Divestiture Notification**	5.3	
Attribute Ownership **Acquisition Notification**	5.4	
Request Attribute **Ownership Acquisition**	5.5	
Request Attribute **Ownership Release**	5.6	
Query Attribute Ownership	5.7	
Inform Attribute Ownership	5.8	
Is **Attribute Owned by Federate?**	5.9	
Request **Federation Time**	6.1	
Request **LBTS**	6.2	
Request **Federate Time**	6.3	
Request **Min Next Event Time**	6.4	
Set **Lookahead**	6.5	
Request **Lookahead**	6.6	
Time Advance Request	6.7	
Next Event Request	6.8	
Flush Queue Request	6.9	
Time Advance Grant	6.10	

Object / Interaction Table

Specify run-time characteristics related to FOM data that affect performance of federation execution

❑ Use: fill out table for each federate
  – objects
    • number simulated by federate
    • attribute sizes, nominal and maximum update rate, maximum tolerable latency, attribute transport and ordering, update groupings, ownership transfer groupings
  – interactions
    • interaction transport and ordering
    • parameter sizes, nominal and maximum update rate, maximum tolerable latency

Object / Interaction Table

Object/Interaction Table

Federate #

Enter Name

Object/Interaction Class	Attribute	Count	Size	Update? Send? (y or n)	If Update =" y" Update Rate # updates/unit time — Nominal	Maximum	Update Conditions* *Not required if FOM provided	Update Grouping (Assign same letter to attributes which will all be updated at the same time)	Transport R= Reliable B= Best Effort	Ordering TSO or FIFO	Subscribe? (y or n)	If Subscribe = y Maximum tolerable latency from any source (milliseconds)	Ownership Attribute Ownership Transfer Rate # times/unit time	Ownership Transfer Grouping (Assign same letter to attributes which will all be transferred together)
Obj 1		10												
	Attribute1		4 bytes	y				A	R	FIFO	y	200	once per fedex	A
	Attribute2		4 bytes	y				B	R	FIFO	n			
	Attribute3		4 bytes	y				A	R	FIFO	y	150		
	Attribute4		4 bytes	y				B	R	FIFO	n			
	Attribute5		4 bytes	y				A	R	FIFO	y	300	once per fedex	A
	Attributen		4 bytes	y				A	R	FIFO				
Interaction 1														
	Parameter1		4 bytes	y							y	200		
	Parameter2		4 bytes	y							n			
	Parameter3		4 bytes	y							y	150		
	Parameter4		4 bytes	y							n			
	Parameter5		4 bytes	y							y	300		
	Parametern		4 bytes	y							n	20		

Table entries are for illustration only

Denotes an invalid cell for entry of data

NOTE: Complete one of these tables for each Federate

Latency Measurement Definition

❏ Latency is measured at the RTI interface on each federate
  – RTI ambassador for updateAttributeValues
  – FederateAmbassador for reflectAttributeValues